



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/734,223	12/15/2003	Patrick Moller	150-137	8649

7590 04/04/2007
Steven S. Payne
8027 ILIFF Drive
Dunn Loring, VA 22027

EXAMINER

VAN, LUAN V

ART UNIT	PAPER NUMBER
----------	--------------

1753

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/04/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No. 10/734,223	Applicant(s) MOLLER ET AL.	
	Examiner Luan V. Van	Art Unit 1753	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 March 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 36-71 is/are pending in the application.
- 4a) Of the above claim(s) 55-71 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 36-54 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☒ None of:
- ☒ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>7/19/04, 6/24/05</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

Applicant's election of claims 36-54 in the reply filed on March 1, 2007 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Priority

Acknowledgment is made of applicant's claim for priority under 35 U.S.C. 119(a)-(d) based upon an application filed in Sweden on June 15, 2001. A claim for priority under 35 U.S.C. 119(a)-(d) cannot be based on said application, since the United States application was filed more than twelve months thereafter.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 36-40, 43, 48, 49 and 54 are rejected under 35 U.S.C. 102(b) as being anticipated by Cohen '369 (US patent 6475369).

Regarding claim 36, Cohen '369 teaches an electrochemical pattern replication method for production of micro- or nano-structures of an electrically conductive material on a substrate, whereby an etching or plating pattern is replicated, defined by an electrically insulating patterned material 6 (Fig. 11b), said method comprising the steps of: using an electrochemical process for transferring said pattern onto the substrate, dissolving a material at an anodic surface (column 7 lines 48-64) and depositing the material 12 (Fig. 11c) at a cathodic surface 2, by placing a master electrode 4a (Fig. 11b) in close contact with the substrate so that the pattern is defined using the master electrode, and said dissolving and depositing of material being performed in local etching or plating cells being formed in closed or open cavities, delimited by an insulating pattern layer of the master electrode, and the substrate, wherein the master electrode is the anodic surface and the substrate is the cathodic surface and the material being dissolved is a predeposited material on the master electrode in the local plating cells.

Regarding claim 37, Cohen '369 teaches wherein the substrate is said anodic surface and the master electrode is said cathodic surface and said cavities are local etching cells (column 30 lines 50-54).

Regarding claim 38, Cohen '369 teaches charging the cavities on the master electrode with an electrolyte solution (column 13 lines 40-59); compressing the substrate and the master electrode in close contact (Fig. 11b), thereby creating the local etching cells charged with the electrolyte solution; and connecting an external voltage

Art Unit: 1753

between the substrate, which is the anode, and the master electrode, which is the cathode (column 30 lines 50-54).

Regarding claim 39, Cohen '369 teaches predepositing a plating material in the cavities on the master electrode (column 7 lines 54-57) and charging them with an electrolyte solution; compressing the substrate and the master electrode in close contact, thereby creating the local plating cells charged with the electrolyte solution; and connecting an external voltage between the substrate, which is the cathode, and the master electrode, which is the anode (column 13 lines 40-59).

Regarding claim 40, Cohen '369 teaches wherein a distance between the master electrode and the substrate is determined by the thickness of the insulating pattern layer (Fig. 11b).

Regarding claim 43, Cohen '369 teaches pulsing the plating current (column 20 lines 13-29).

Regarding claim 48, Cohen '369 teaches no supporting electrolyte, and a high concentration of electro active species, since the electrolyte of Cohen '369 is sufficient to electroplate a metal on a substrate.

Regarding claim 49, the counter ions in the electrolyte solution of Cohen '369 are inherently exchanged to ones which provide higher solubility, because Cohen '369 uses the same electrolytic process and solution as that of the instant invention.

Regarding claim 54, Cohen '369 teaches said electrolyte solution is an optimized electrolyte in the local etching cells or the local plating cells.

Art Unit: 1753

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 41 and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cohen '369 in view of McIntyre et al. (US patent 4279709).

Cohen '369 teaches the method as described above. Cohen '369 differs from the instant claims in that the reference does not explicitly teach cleaning and etching the electrode.

McIntyre et al. teach that prior to coating an electrode, the surfaces of the electrode substrate are usually clean to remove any contaminants and to ensure good adhesion of the coating. Cleaning techniques such as vapor decreasing, chemical etching, and/or grit blasting and the light or combinations of such means may be used. (Column 4 lines 52-53).

Art Unit: 1753

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the method of Cohen '369 by etching the electrode as taught by McIntyre et al., because it would remove contaminants from the surfaces of the electrode.

Claims 44-47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cohen '369 in view of Tang et al. (US patent 6036833).

Cohen '369 teaches the method as described above. Cohen '369 differs from the instant claims in that the reference does not explicitly teach the specific frequency of the instant claim or periodic pulse reverse.

Tang et al. teach an electroplating method using periodic pulse reverse and a frequency from 100 to 10,000 Hz (column 2 lines 8-9).

Addressing claims 44 and 45, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the method of Cohen '369 by using the frequency of Tang et al., because it would produce a more fine-grained and hard plating metal (column 1 lines 33-37 of Tang et al.).

Addressing claims 46 and 47, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the method of Cohen '369 by using the periodic pulse reverse of Tang et al., because it would reduce the internal stress of the electrodeposit (column 2 lines 55-60 of Tang et al.).

Art Unit: 1753

Claims 50, 51 and 53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cohen '369 in view of Scott (US patent 5196109).

Cohen '369 teaches the method as described above. Cohen '369 differs from the instant claims in that the reference does not explicitly teach a sequestering agent or the pH of the instant claim.

Scott teaches an electroplating method and composition using EDTA (column 6 lines 41-61) and a pH of 1.5 to 5.5 (column 6 lines 8-11).

Addressing claims 50 and 51, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the method of Cohen '369 by using the sequestering agent of Scott, because it would prolong the useful operating life of the electrolyte necessitating less frequent treatments with precipitating agents or peroxide treatments to remove such harmful metal ions and organic contaminants when their concentrations increase to objectionable levels (column 6 lines 48-54 of Scott).

Addressing claim 53, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the method of Cohen '369 by using the pH range of Scott, because it would increase the conductivity of the electrolyte solution and hence reduce the power consumption required for electrodeposition (column 5 lines 63-65 of Scott).

Claim 52 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cohen '369 in view of Bernards et al. (US patent 4932518).

Art Unit: 1753

Cohen '369 teaches the method as described above. Cohen '369 differs from the instant claims in that the reference does not explicitly teach the additive system of the instant claim.

Bernards et al. teach a composition for electroplating copper onto a conductive surface comprising a solution having brighteners (i.e., accelerators), suppressors, wetting agents, and levelers (column 4 lines 29-55).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the method of Cohen '369 by using additive system of Bernards et al., because it would improve the efficiency of the plating reaction and the quality of the metal deposit (column 1 lines 23-31 of Bernards et al.).

Conclusion

The prior art made of record and not relied upon is considered pertinent to the applicant's disclosure. The following US patents are hereby made of record: 5252196, 3376206, 3240685, 6027630, 6790377, and 6572742.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Luan V. Van whose telephone number is 571-272-8521. The examiner can normally be reached on M-F 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 1753

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



NAM NGUYEN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700

LVV

3/28/07